

Claims

1. A method for producing a silica aerogel, which comprises combustion of rice
husk until the white ash is obtained, dissolving rice husk ash in aqueous sodium
5 hydroxide, heating and stirring the resultant gel mixture to produce a sodium
silicate solution, adding concentrated sulphuric acid to the resulting water glass
solution to convert the sodium silicate to silica and produce a silica hydrogel,
aging the hydrogel to allow the gel structure to develop, displacing the water with
a C₁ to C₄ alcohol, to produce an alcogel, and subjecting the alcogel, to super
10 critical drying to form an aerogel.
2. The method according to Claim 1 wherein the rice husk is combusted at a
temperature in the range of 600°C to 700°C with excess air until the white ash is
obtained.
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3. The method according to Claims 1 to 2, wherein the rice husk ash contains 92 –
97% of amorphous silica and trace amount of cations.
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4. The method according to Claim 3, wherein trace amount of cations present in rice
husk silica are K⁺, Ca²⁺, Mg²⁺, Al³⁺, Fe³⁺.
5. The method according to Claims 1 to 4, wherein the purity of silica of above 98%
can be achieved by washing the rice husk in 1M sulphuric acid solution, followed
by air drying prior to combustion.
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6. The method according to Claim 1, wherein the amounts of rice husk ash and
sodium hydroxide are such as to give a ratio of Na₂O:SiO₂ of between 1:3 and
1:4.
- 30 7. The method according to Claim 1, wherein the ratio of Na₂O:SiO₂ is about 1:3.33.

8. The method according to Claim 1 to 7, wherein the sodium silicate solution contains from 8 to 10% by weight of SiO₂.
9. The method according to Claim 8, wherein the sodium silicate solution contains
5 9% by weight of SiO₂.
10. The method according to any one of Claims 1 to 9, wherein the hydrogel is aged for a period of up to 5 days.
- 10 11. The method according to Claims 1 to 10, wherein the C₁ to C₄ alcohol is methanol or ethanol.
12. The method according to any one of Claims 1 to 11, wherein hydrophilic aerogels are converted to hydrophobic aerogels by alkylation.
- 15 13. Silica aerogels produced by a process according to any one of claims 1 to 12.